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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/777,434 | 02/12/2004 | Rainer Paetzel | LMPY-20010 | 4784 |

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STALLMAN & POLLOCK LLP
353 SACRAMENTO STREET
SUITE 2200
SAN FRANCISCO, CA 94111

| EXAMINER | |
|---|---|
| LANE, JEFFREY D | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2828 | |

DATE MAILED: 02/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/777,434 | PAETZEL, RAINER | |
| | Examiner | Art Unit | |
| | Jeffrey D. Lane | 2828 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *28 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/19/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 4, 6, 7, 12, 14, 18, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Ujazdowski et al. (US 6,034,978).

As for claim 1, Ujazdowski discloses in fig. 16, A heat exchange system for stabilizing gas temperature in a pulsed gas discharge laser (See Abstract), the laser including a discharge chamber having at least two electrodes (fig 1, 18 and 20) for energizing a laser gas in the discharge chamber 86 to generate optical pulses according to a pulse pattern, the heat exchange system comprising: a flow control valve (proportional valve) for controlling an amount of fluid flowing through the discharge chamber 86; a system controller 88 for determining an amount of energy dissipation for a period of the pulse pattern and generating a dissipation signal in response thereto (See Column 10 lines 15-55 more specifically lines 35 & 47-49); and a temperature regulation controller (PID Controller) in communication with the flow control valve

(Proportional Valve) and capable of receiving the dissipation signal, the temperature regulation controller capable of adjusting the amount of fluid flowing through the flow control valve (Proportional Valve) based, at least in part, on the amount of energy dissipation conveyed by the dissipation signal (See Column 12 line 66 – Column 13 line 3).

As for claim 2, Ujazdowski discloses in fig 17B a fluid source (IN) for providing the fluid at a source temperature; all materials inherently have a temperature.

As for claim 4, Ujazdowski discloses in fig. 2, a temperature sensor 330 at least partially within the discharge chamber for measuring a laser gas temperature and providing a second temperature signal to the temperature regulation controller, the temperature regulation controller capable of adjusting the amount of fluid flowing through the flow control valve based, at least in part, on the second temperature signal (See Column 2 lines 4-8).

As for claim 6, Ujazdowski discloses, tubing at least partially within the discharge chamber for contacting the gas mixture and containing the fluid flowing through the discharge chamber (See fig. 17A, 17B or 66 of figs. 1, 2, 8 or 9).

As for claim 12, Ujazdowski discloses, A method for stabilizing gas temperature in a pulsed gas discharge laser (See Abstract), comprising: directing a flow of cooling fluid (See column 4 lines 12-13) through tubing disposed at least partially within a discharge chamber of the laser such that the tubing contacts a gas mixture in the discharge chamber (See fig. 17A, 17B or 66 of figs. 1, 2, 8 or 9); determining an amount of energy dissipation over a period of a pulse pattern of the laser in order to determine

an amount of energy dissipation in the discharge chamber (See Column 10 lines 15-55 more specifically lines 35 & 47-49); and adjusting an amount of cooling fluid flowing through the tubing based, at least in part, on the amount of energy dissipation over that period of the pulse pattern (See Column 12 line 66 – Column 13 line 3).

As for claim 14, Ujazdowski discloses in fig. 2, measuring the gas temperature in a laser tube of the laser (via gas sensor 330); and adjusting the amount of cooling fluid flowing through the tubing based, at least in part, on the gas temperature (See Column 12 line 66 – Column 13 line 3).

As for claim 7 and 18, Ujazdowski discloses, the system controller is further capable of selecting the period for determining the energy dissipation (See Column 9 lines 36-41).

As for claim 19, Ujazdowski discloses having bursts of 0.3 seconds (See Column 9 lines 36-41). Ujazdowski further discloses that the response time for the temperature sensor is 0.1 seconds (See Column 10 lines 49-51). And therefore Ujazdowski's discloses reads on, selecting the period over which the amount of energy dissipation is determined, the length of the period being shorter than a response time of a temperature sensor used to measure the temperature of the gas mixture.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 3, 5, 8, 11-13, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Partlo et al. (US 6,021,150) in view of Ujazdowski et al. (US 6,034,978).

As for claim 1, Partlo discloses, A heat exchange system for stabilizing gas temperature in a pulsed gas discharge laser (See abstract), the laser including a discharge chamber having at least two electrodes for energizing a laser gas in the discharge chamber to generate optical pulses according to a pulse pattern, the heat exchange system comprising (See Figure 6): a flow control valve (Figure 9, 900) for controlling an amount of fluid flowing through the discharge chamber 320 (compare fig 9 and 6); and a temperature regulation controller in communication with the flow control valve (See Column 8 lines 51-56), the temperature regulation controller capable of adjusting the amount of fluid flowing through the flow control valve based (See Column 8 lines 51-56). However Partlo does not disclose a system controller generating a signal based on energy dissipation. Ujazdowski discloses, "controller receives a signal from the stepper or scanner 74 in advance of idle periods, such as at the start of a series of bursts. Controller 70 is programmed to turn heater 72 on and off on a cycle which is calculated to minimize the gas temperature fluctuation due to the extended several-second idle period." Therefore it would have been obvious at the time of the invention to use a system controller that generates a dissipation signal to minimize the gas temperature fluctuations.

As for claim 3, Partlo discloses in figure 9, a temperature sensor for measuring the source temperature 930 and providing a first temperature signal to the temperature regulation controller, the temperature regulation controller capable of adjusting the amount of fluid flowing through the flow control valve based, at least in part, on the first temperature signal (See column 11 lines 29-36).

As for claim 5, Partlo discloses in fig. 6, a temperature sensor outside the discharge chamber 600 for measuring a laser tube temperature, the laser tube containing the discharge chamber, and providing a third temperature signal to the temperature regulation controller, the temperature regulation controller operable to adjust the amount of fluid flowing through the flow control valve based, at least in part, on the third temperature signal. (See Column 8 lines 57-62)

As for claim 8, Partlo discloses a laser tube 120 containing the discharge chamber; and an active heating element in contact with the laser tube and operable to heat the laser tube (See Column 12 lines 18-19).

As for claims 11 and 16, Partlo further discloses, the temperature regulation controller is further in communication with the active heating element (See Coulmn12 lines 14-26), however Partlo does not disclose the heating element in communication with the Power dissipation. Ujazdowski discloses, "controller receives a signal from the stepper or scanner 74 in advance of idle periods, such as at the start of a series of bursts. Controller 70 is programmed to turn heater 72 on and off on a cycle which is calculated to minimize the gas temperature fluctuation due to the extended several-second idle period." Therefore it would have been obvious at the time of the invention to use a system

controller that generates a dissipation signal to minimize the gas temperature fluctuations.

As for claim 12, Partlo discloses, a method for stabilizing gas temperature in a pulsed gas discharge laser, comprising: directing a flow of cooling fluid through tubing 320 disposed at least partially within a discharge chamber of the laser such that the tubing 320 contacts a gas mixture in the discharge chamber, and adjusting an amount of cooling fluid flowing through the tubing (See Column 8 lines 51-56). However Partlo does not disclose a system controller generating a signal based on energy dissipation. Ujazdowski discloses, "controller receives a signal from the stepper or scanner 74 in advance of idle periods, such as at the start of a series of bursts. Controller 70 is programmed to turn heater 72 on and off on a cycle which is calculated to minimize the gas temperature fluctuation due to the extended several-second idle period." Therefore it would have been obvious at the time of the invention to use a system controller that generates a dissipation signal to minimize the gas temperature fluctuations.

As for claim 13, Partlo discloses in fig 9, measuring a temperature 930 of the cooling fluid; and adjusting the amount of cooling fluid flowing through the tubing based, at least in part, on the temperature of the cooling fluid (See column 11 lines 29-36).

As for claim 15, Partlo discloses in fig 6, measuring the tube 120 temperature 600 of a laser tube of the laser; and adjusting the amount of cooling fluid flowing through the tubing based, at least in part, on the tube temperature (See Column 8 lines 57-62).

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Partlo et al. (US 6,021,150) in view of Ujazdowski et al. (US 6,034,978) as applied to claim 8 above, and further in view of Rowley et al. (US 4,987,574). Partlo and Ujazdowski disclose all that pertains to claim 8 above. However, they do not disclose the heating element being a foil-heating pad Rowley discloses, "For example, foil heaters, coils or strip heaters may be used for the alignment and length adjusting heaters." (Column 5 lines 3-5). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a foil heating pad so that is has adjusting length.

6. Claims 9 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Partlo et al. (US 6,021,150) in view of Ujazdowski et al. (US 6,034,978) as applied to claim 8 above, and further in view of Meier (US 5,617,440).

As for claims 9 and 17, Partlo and Ujazdowski disclose all that pertains to claim 8 above. However, they do not disclose the heating element surrounding the laser tube. Meier discloses, "The metallic housing serves as an oven for setting the temperature of the laser tube. The heating is intended to avoid stressing the laser tube, in order not to vary the inclination of the mirrors with respect to one another. " (Column 1 lines 17-21). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to make the heating element surround the laser tube to avoid stressing the tube.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Partlo et al. (US 6,021,150) in view Meier (US 5,617,440).

As for claim 20, Partlo discloses, A temperature regulation system for stabilizing gas temperature in a pulsed gas discharge laser (See Abstract), the laser including a laser tube having at least two electrodes for energizing a laser gas in the laser tube to generate optical pulses according to a pulse pattern, the temperature regulation system comprising: an active heating element and capable of heating a body of the laser tube; and a temperature sensor (600 of fig.6) capable of measuring a temperature of the laser tube body 120 and generating a signal in response thereto, the active heating element capable of receiving the signal adjusting the heating of the body based, at least in part, on the temperature of the laser tube (See Column 12 lines 14-26). However Partlo does not expressly disclose, having the heating element surrounding the laser tube. Meier discloses, "The metallic housing serves as an oven for setting the temperature of the laser tube. The heating is intended to avoid stressing the laser tube, in order not to vary the inclination of the mirrors with respect to one another. " (Column 1 lines 17-21). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to make the heating element surround the laser tube to avoid stressing the tube.

8. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Partlo et al. (US 6,021,150) in view Meier (US 5,617,440) as applied to claim 20 above, and further in view of Ujazdowski et al. (US 6,034,978).

As for claim 21 Partlo and Meier disclose all that pertains to claim 20, see above. However they do not expressly disclose a system controller using information about energy dissipation. Ujazdowski discloses, "controller receives a signal from the stepper or scanner 74 in advance of idle periods, such as at the start of a series of bursts. Controller 70 is

programmed to turn heater 72 on and off on a cycle which is calculated to minimize the gas temperature fluctuation due to the extended several-second idle period." Therefore it would have been obvious at the time of the invention to use a system controller that generates a dissipation signal to minimize the gas temperature fluctuations.

As for claim 22, Partlo further discloses, a gas temperature sensor 330 at least partially within the laser tube for measuring the gas temperature and providing a gas temperature signal to the system controller to be used in generating the control signal.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey D. Lane whose telephone number is (571) 272-1676. The examiner can normally be reached on Monday thru Friday 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeffrey D Lane
Examiner
Art Unit 2828

JDL

MINSUN CHI HARVEY
PRIMARY EXAMINER